Comments on the Auctions of Advanced Wireless Services Licenses by the FCC

by the Center on the Study of Auctions, Procurements and Competition Policy (CAPCP)

at Penn State University[1]

Two major changes to the FCC's simultaneous multiple round (SMR) auction design are being proposed. The first change restricts information made available to bidders at each round of the auction such as bidders' identities and the amount of non-winning bids, where "winning" refers to the highest bid in a given round. The second change considers the use of package bidding in which bidders could choose to bid on a package of licences of their own choice. These auctions could be run concurrently with the auctions of individual licenses following a similar SMR format up to some adaptations such as an aggregate reserve price.

We will comment on such changes in view of our knowledge and understanding of auction theory. The SMR format is essentially a multiple object version of the standard English or open ascending auction for a single object. While a detailed theoretical analysis of the SMR auction has not been performed yet, we do have a good understanding of the English auction. By nature, the bidding process in an English auction reveals important information that tends to increase the efficiency of the allocation mechanism. Consider the case of an object with some common value component. As such, every bidder has a private signal or estimate of the object's value. By learning the signals of other bidders through the auction process, a bidder can improve the accuracy of his own assesment. For instance, when a bidder drops out, active bidders can infer about his signal and act on this information such as decrease their own estimate and bid accordingly. Consequently, the information on the price at which bidders become inactive is used by other active bidders to update their bidding strategies. When bidders are asymmetric, the identities of bidders play the same key role in the bidding process. It is the flow of information on bidders' identities and on prices at which bidders drop out of the auction, which renders the allocation efficient in an English auction. If such information is suppressed, then the efficiency properties of the English auction are lost.[2]

[1]Professors Kalyan Chatterjee, Vijay Krishna and Isabelle Perrigne have participated to the writing of this note.

[2]The allocative efficiency of the English auctions is well known in the auction theoretical literature. See Maskin (1992)

The parallel with English auctions suggests that restricting the information available to bidders will have a similar effect in the SMR auction. In this respect, we tend to disagree with the FCC's contention (page 6, lines 1-3) that economic efficiency of an SMR auction may be enhanced if certain information about bids and bidders' identities is not revealed publicly prior and during the auction. It is our understanding that a sequential format was chosen in the first place to increase the flow of information across bidders and to reduce the "winner's curse" effect, which is inherent to bidding when some common value component exists. See also the above discussion. Limiting the availability of information seems to work against the original rationale for a sequential auction.

There have been some concerns, however, that information on bids and bidders' identities along the bidding process may facilitate anti-competitive bidding behavior. The above reasoning, which emphasizes the positive role played by information on economic efficiency, relies on the condition that bidders do not engage in anti-competitive behavior. Information on bids and bidders' identities at each round may permit bidders to coordinate bidding in a way to lower prices.[3] Thus it appears that the FCC faces a trade-off between economic efficiency and potential collusion. Such a trade-off has been acknowledged by many economists who worked on auction design for spectrum. Klemperer (2002), who draws from several experiences in Europe and the US, argues that the insights from auction theory, though valuable, might have to take a second place to the concerns of deterring collusion and encouraging entry of bidders.[4] Making bids public in a multi-round auction would tend to facilitate coordination among bidders leading to some tacit collusion and division of the market. The benefits and costs of the proposed change concerning the restriction of information made available to bidders essentially boil down to this trade-off. If bidders are relatively sophisticated, the proposed change makes some sense in making tacit collusion

"Auctions and Privatization," in *Privatization*, H. Siebert, ed., Institut fur Weltwirtschaften der Universitat Kiel, pp 115-136, Krishna (2003) "Asymmetric English Auctions," *Journal of Economic Theory*, 112, pp. 261-288 and Izmalkov (2003), "English Auctions with Reentry," Working Paper, MIT.

[3]Reitsma, Stone, Csirik and Littman (2002), "Self-Enforcing Strategic Demand Reduction," in *Agent Mediated Electronic Commerce*, J. Padget, O. Shehory, D. Parkes, N. Sadeh and W. Walsh, eds., Springer, pp 289-306, propose some collusive strategies for bidders relying on this information.

[4]Klemperer (2002), "What Really Matters in Auction Design," *Journal of Economic Perspectives*, 16, pp. 169-189.

through signalling by bids more difficult. This inherent trade-off should be recognized by the FCC.

Regarding the second proposed change on package bidding, the theoretical auction literature provides us little background to lead our discussion. As such, we are uncertain on the effects of running concurrent individual license and package auctions and allowing bidders to bid on both. The existence of strong complementarities or cost synergies among different items has been in favor of package bidding as bundling these items might be beneficial. The usual examples of such features can be found in bus routes and landing and take-off slots at airports. A further analysis in the case of wireless licenses could highlight the existence of such complementarities and/or synergies to justify the use of package bidding. Nonetheless, the implementation of such package auctions, seems to be computationally demanding for both bidders and the FCC. The choice of the package, the computation of the aggregate reserve price are just a few examples of some strategic aspects involved in these auctions. These auctions may also facilitate an implicit division of licenses across bidders, thereby reducing competition.